

**Information on the Lesser Amberjack, Almaco Jack, and
Banded Rudderfish Fishery Complex in the Atlantic Ocean
through 1995**

by

David B. McClellan

and

Nancie J. Cummings

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**U.S. Department of Commerce
National Oceanic and Atmospheric Administration
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Southeast Fisheries Science Center
Miami Laboratory
75 Virginia Beach Drive
Miami, Florida 33149**

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Introduction

Amberjacks, Seriola species, contribute significantly to important recreational and commercial fisheries along the entire southeastern United States (Berry and Burch 1978, Burch 1979). The banded rudderfish (S. zonata), almaco jack (S. rivoliana), and lesser amberjack (S. fasciata) are important by-catch of reef fish fisheries along the U. S. Atlantic east coast. These species are important components of the overall greater amberjack (S. dumerili) fishery however, they comprise a small percentage of the total landings in comparison to the greater amberjack.

Recently, recreational and charterboat fishers in Florida and Alabama have made many complaints about a perceived decline in the abundance of the overall amberjack fishery, including these minor species. This change in abundance however, has not been observed in the commercial fisheries. This concern prompted the Florida Marine Fisheries Commission to hold a series of workshops and public hearing in the summer of 1996 devoted to assessing the public opinion as to the status of all four species of amberjacks (Williams 1996). In addition, the Gulf of Mexico and the South Atlantic Fishery Management Councils requested information on the current status of the greater amberjack and proposed changes in fishery regulations on the minor amberjack species intended to provide additional protection for greater amberjack (FMP Amendment 12, proposed rule).

Objectives

Fisheries statistics presented by Parrack (1993) for the lesser amberjack, almaco jack, and banded rudderfish are updated. Data through 1995 include: 1) reported commercial landings; 2) summary catch per unit of effort statistics from the recreational charterboat, private vessel, and headboat fisheries and

commercial vessels reporting from logbooks; 3) summary data on observed sizes and individual weights from the commercial and recreational fisheries; and 4) results of updated bag limit analyses.

Available Data

The data sources for the analyses conducted in this report are identical to those of the study of Parrack (1993). Commercial landings data were obtained from the National Marine Fisheries Service (NMFS), Southeast Fisheries Science Center (SEFSC), Research Management Division (RMD) and included data from port agents, routine data summaries by the Florida Department of Environmental Protection (FDEP), and logbook reports received from commercial vessels landing reef fish. Recreational harvest estimates were obtained from the National Marine Recreational Fisheries Survey (MRFSS), the NMFS Beaufort Laboratory Headboat Survey, and the Texas Parks and Wildlife Department (TPWD). Abundance information was extracted from intercepts of catch per trip, catch per angler, catch per boat, and/or catch per unit of time fished from recreational and commercial fishing trips of the above sources. In all analyses, the resolution retained in the data was that of the previous study and is completely described in Parrack (1993).

Results

Commercial Landings

Total landings of the minor amberjack species, reported by commercial fishermen sending logbooks to the NMFS since 1992, averaged 118,920 pounds per year (range 87,101 to 161,693, Table 1a). Total landings for the Gulf of Mexico group averaged 111,786 lbs/year (Cummings and McClellan 1996). Landings from 1992 should be considered as partial landings since reporting

only became mandatory during that year. The minor species of amberjacks were landed most often in Florida (east coast) and in North Carolina. Fishing trips with catches of almaco jacks were reported most often, followed by lesser amberjack and banded rudderfish. Landings (pounds) since 1994 of almaco jack and lesser amberjack have been nearly equal (Table 1a). Overall, landings (pounds) of all species by commercial vessels have showed no real trend between 1993-1995 (Figure 1a). North Carolina landings of banded rudderfish have shown an upward trend (Figure 1b). Minor amberjack species were reported caught most often by vessels using handlines, with trolling lines, longlines, powerheads, and spearguns also reported (Table 2, Figure 2). Fish traps, used in the Gulf of Mexico fisheries (Cummings and McClellan 1996) were not utilized in Atlantic Ocean waters.

Recreational Harvest

The total estimated recreational catch of lesser amberjack by private vessels, charterboats, and headboats ranged from 0 to 5,395 fish per year between 1981 and 1995 (Table 3a). The estimated total catch of almaco jack ranged from 0 to 11,771 fish per year between 1981 and 1995 (Table 3b) and were caught more frequently by all types of recreational anglers than the other species. Estimates of recreational catches of banded rudderfish were extremely variable by area and some years had very large variances. Large catches were estimated for areas north of North Carolina, but were rarely landed (with the exception of 1986 and 1988) on the Atlantic east coast (Table 3c). Catches of unidentified amberjacks occurred in large quantities (Table 3d,e). Annual estimates of the total recreational catch of the minor amberjack species are shown in Figure 3.

Nearly all of the recreational catch of lesser amberjack occurred in Florida or North Carolina with the charterboat fishery dominating the catch (Table 4a). Almaco jack were most often caught in Florida with lesser catches made in the Carolinas

(Table 4b). Banded rudderfish were also most often captured in Florida with large catches being indicated for the shore based mode in North Carolina (Table 4c). Amberjacks, from headboats, and unidentified jacks also were reported most often from Florida and North Carolina (Table 4d,e).

Biostatistical Sampling

Commercial Fishery

The availability of length and weight samples recorded for the minor amberjack species is given for the commercial and recreational fisheries in Tables 5a-c. These tables indicate the level of sampling of lesser amberjack remained the same as observed for the 1993 assessment. Observations of almaco jack and banded rudderfish increased significantly since 1992 and this was apparent for the headboat and the commercial fisheries. Whether the frequency of sampling by species suggests abundance levels between species is not known. Headboats were the most often sampled recreational fisheries for all three minor amberjack species.

Sample average length of lesser amberjack landed by commercial vessels ranged from 42 cm to 57 cm between 1985 and 1995 without strong apparent trend, while sample average weight varied from 4 lbs. to 10 lbs. over the period (Table 6a, Figures 4,5). The value of any trend information regarding size of lesser amberjack from the commercial fishery is reduced, especially between 1985 and 1990, because of sample sizes of 10 or fewer fish (Tables 5,6a).

Sample average length of almaco jack landed by commercial vessels varied from 66 cm to 80 cm between 1984 and 1995 without apparent trend (Figure 4). Sample average weight showed a slight increase between 1984 and 1990 from 11 lbs. to 13 lbs. (Table 6b, Figures 4,5).

Commercial sampling of banded rudderfish for length was very erratic since 1985 with sample sizes below 25 fish in most years.

Average length ranged from 50 cm to 61 between 1985 and 1995 (Table 6c, Figure 4). Sample average weight declined from 8 lbs. to 5 lbs. from 1985 - 1999 however, sample sizes are very low (Table 6c, Figures 4,5).

Recreational Fishery

As observed in the Parrack (1993) study lesser amberjack were more often measured from headboat catches. Although sample sizes are extremely low, sample average lengths have tended to decline since 1974, from 64 cm to 45 cm (Figures 4 and 5). In addition, the few samples of average weight obtained suggest a decline in average weight over the same period (Table 5a, Figure 6a). Special effort sampling of this species would be required before any credence could be put into this trend. Samples of lesser amberjack from the other recreational private and charter boat fisheries are almost non-existent in the database.

Recreational headboat catches were the most frequently sampled for almaco jack with sample sizes increasing significantly after 1992. Sample average length varied from 40 cm to 79 cm between 1973 and 1995, generally without trend (Table 5b, Figure 4). Sample average weight ranged from 7 lbs. to 20 lbs. over the same period (Figure 6).

There were two distinct periods of length sampling observed for banded rudderfish, 1979-1985 and 1993-1995 (Table 5c). Very few samples were taken from 1986-1992. Sample average length varied from 36 cm to 74 cm across the two periods (Figure 5). Nearly all length samples were from the headboat fishery and indicated average length remained constant since 1986 (Figure 6). Banded rudderfish were larger on average than those landed in the Gulf of Mexico (Cummings and McClellan 1996).

Catch Per Unit of Effort (CPUE)

Commercial Vessels or Commercial Logbooks

Table 7 shows average pounds reported per trip landed for the three minor species of amberjacks. Lesser amberjack commercial CPUE varied from 85 lbs. per trip to 169 lbs. per trip between 1994 and 1996 (Table 7). The logbook data indicate that powerheads and spearguns are important gear in catching this species (Figure 7). Commercial CPUE of almaco jack ranged from 118 lbs. per trip to 243 lbs. per trip from 1992-1995 with the largest observable change occurring between 1992 and 1993 (Table 7). As with lesser amberjack, powerheads and spearguns were important gears (Figure 7). Banded rudderfish CPUE ranged from 55 lbs. to 112.5 lbs. per trip from 1992-1995. Nearly all banded rudderfish were caught with handline gear.

Recreational Fishing Trips

Recreational CPUE information is presented in Table 8 for the minor amberjack species from the MRFSS and the NMFS headboat catch intercepts. Too few observations were available to obtain abundance information for lesser amberjack. As with information on size for this species, special effort studies are required in order to obtain intercepts of CPUE for this species. The NMFS headboat survey provided sufficient samples of fishing success to obtain CPUE information for both almaco jack and banded rudderfish. These data suggest that recreational CPUE for these species varied without trend between 1976 and 1995.

Recreational Bag Limit Analyses

The 1995 observations of recreational CPUE were used in the bag limit analyses. The MRFSS survey catch interviews were insufficient to determine effects of bag limit restrictions on the private angler and charterboat fisheries for all species. Only the NMFS headboat data series could be used and data were sufficient enough for only almaco jack. Those results suggest that a one fish bag limit would result in a reduction of catch of about 3% for almaco jack caught by headboat anglers in the

Atlantic Ocean (Table 9).

Summary

This study improves on fisheries information available for minor amberjack species. Some of the work suggested in Parrack 1993 was conducted. Commercial logbooks were evaluated to ascertain the magnitude of landings and to provide information on the type of gear and the main landing states that capture the less important species of the Seriola species complex. The time series is admittedly short however, these statistics corroborate the notion that lesser amberjack, almaco jack, and banded rudderfish are indeed landed in significant quantities in the Atlantic Ocean region.

The available information on size was reviewed to determine if sampling rates were improved since the 1993 study. This study indicates that sampling levels were improved for almaco jack and banded rudderfish in both the commercial and recreational fisheries. MRFSS sampling rates remain very low and were not useful for evaluation of trends in size or abundance due to insufficient data.

Future studies of the minor amberjack species should focus on improving sampling rates for the commercial and headboat fisheries of these incidentally caught amberjacks. In addition, managers should emphasize the importance of holding workshops with the commercial industry for purposes of ensuring proper species identification.

Recreational CPUE data were insufficient to fully evaluate potential effects of additional bag limits on recreational, charter, private, or shore based fisheries for banded rudderfish. The MRFSS survey data indicates catches of lesser amberjack and banded rudderfish have been small in the Atlantic region. A

regulation on these species would theoretically impact the headboat fishery and most likely impact banded rudderfish more so than lesser amberjack. Significant catches of banded rudderfish do apparently occur north of North Carolina,

Parrack (1993) reminded managers that caution should be exercised when using estimates of recreational catch of the minor amberjack species. The main reasons for concern were the species identification problems that surround these species and the large variance estimates associated with the MRFSS estimates. In addition large quantities of unidentified jacks occur in the catch records. Because of the frequency in which these minor amberjacks are encountered in recreational sampling and unless devoted efforts are made to obtain samples, probably only the headboat fishery database should be used to obtain trend information on CPUE and size. Too few observations were available to obtain abundance information for lesser amberjack. As with information on size for these species, special effort studies are required in order to obtain intercepts of CPUE.

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Table 1. Commercial landings (pounds) of the minor amberjack species from the Atlantic Ocean group reported by logbooks by state and species landed. n = number of trips.

a.

Lesser amberjack										
Year	Florida (east)		Florida (west)		Georgia		North Carolina		South Carolina	
	n	lbs	n	lbs	n	lbs	n	lbs	n	lbs
92	8	1896.0	6	205.3	7	3007.0	87	4727.0	13	1083.0
93	52	17465.0	8	385.0	39	2809.0	135	10755.0	65	7291.0
94	104	43037.0	12	1059.0	41	4876.0	201	14426.0	80	10555.0
95	122	29662.0	15	627.2	63	4561.0	227	17510.0	115	14438.0

Almaco jack										
Year	Florida (east)		Florida (west)		Georgia		North Carolina		South Carolina	
	n	lbs	n	lbs	n	lbs	n	lbs	n	lbs
92	97	23404.0	43	29154.0	3	1876.0	80	6304.0	63	8751.0
93	209	20914.0	13	644.9	18	1536.0	223	22536.0	51	13761.0
94	252	41116.0	16	601.2	14	1918.0	296	25299.0	17	1837.0
95	230	31326.0	28	562.5	44	4858.0	261	27648.0	40	2444.0

Banded rudderfish										
Year	Florida (east)		Florida (west)		Georgia		North Carolina		South Carolina	
	n	lbs	n	lbs	n	lbs	n	lbs	n	lbs
92	9	2091.0	2	44.7			77	3028.0	4	1531.0
93	48	1441.0	5	742.6			127	7830.0	5	189.3
94	46	2455.0	3	122.7	3	162.2	145	12270.0	13	1958.0
95	39	1753.0	12	801.9	5	333.9	182	14948.0	20	1730.0

b.

Year	Lesser amberjack		Almaco jack		Banded rudderfish		Combined	
	n	lbs	n	lbs	n	lbs	n	lbs
92	121	10918.0	286	69489.0	92	6694.0	499	87101
93	299	38705.0	514	59391.0	185	10203.0	998	108299
94	438	73953.0	595	70772.0	210	16968.0	1243	161693
95	542	66799.0	603	66838.0	258	19566.0	1403	153203
96	378	32085.0	305	39085.0	116	13136.0	799	84306

Table 2. Distribution of commercial landings of the minor amberjack species by gear as reported by logbooks, 1992-1995. H=handline, L=longline, P=powerheads, S=spears, and Tr=troll. N = number of trips.

Lesser amberjack													
Year	Gear	Florida (east)		Florida (west)		Georgia		North Carolina		South Carolina		ALL	
		n	lbs	n	lbs	n	lbs	n	lbs	n	lbs	n	lbs
92	H	8	1896.0	6	205.3	7	3007.0	81	4050.0	13	1083.0	115	10241.0
	L					1	15.6			1		1	15.6
	P					1	449.3			1		1	449.3
	S					4	212.1			4		4	212.1
	TR					87	4727.0						
	ALL	8	1896.0	6	205.3	7	3007.0			13	1083.0	121	10918.0
93	H	47	17070.0	8	385.0	39	2809.0	123	9271.0	61	6946.0	278	36481.0
	L	1	158.1							4	345.3	5	503.4
	P											4	236.1
	S	4	236.1					12	1484.0			12	1484.0
	TR							135	10755.0	65	7291.0	299	38705.0
	ALL	52	17465.0	8	385.0	39	2809.0						
94	H	96	42153.0	12	1059.0	41	4876.0	182	12743.0	78	10496.0	409	71327.0
	L							4	1008.0	2	59.2	6	1067.0
	P	1	384.8									1	384.8
	S	7	499.1					15	675.7			7	499.1
	TR							201	14426.0	80	10555.0	15	675.7
	ALL	104	43037.0	12	1059.0	41	4876.0					438	73953.0
95	H	103	27276.0	14	616.8	63	4561.0	206	15680.0	115	14438.0	501	62573.0
	L	5	200.7					2	174.8			7	375.5
	P	11	852.8									11	852.8
	S	2	1280.0	1	10.4			19	1655.0			3	1291.0
	TR	1	52.0					227	17510.0	115	14438.0	20	1707.0
	ALL	122	29662.0	15	627.2	63	4561.0					542	66799.0

Almaco jack													
Year	Gear	Florida (east)		Florida (west)		Georgia		North Carolina		South Carolina		ALL	
		n	lbs	n	lbs	n	lbs	n	lbs	n	lbs	n	lbs
92	H	70	20284.0	42	28988.0	3	1876.0	72	4488.0	59	8514.0	246	64151.0
	L	19	2800.0			1	176.8	2	187.2	22		22	3164.0
	P					1		6				10	
	S	8	320.0	1	165.4			1	1165.0			8	524.2
	TR							6	474.3				
	ALL	97	23404.0	43	29154.0	3	1876.0	80	6304.0	63	8751.0	286	69489.0
93	H	168	18538.0	13	644.9	18	1536.0	201	17085.0	48	13427.0	448	51231.0
	L	24	1526.0					8	5020.0			32	6546.0
	P							1				14	
	S	13	580.4					13	349.3	3	333.8	19	905.7
	TR	3	222.6					223	22536.0	51	13761.0	514	59391.0
	ALL	209	20714.0	13	644.9	18	1536.0						
94	H	207	36219.0	15	495.1	14	1918.0	289	24747.0	17	1837.0	542	65216.0
	L	1	69.7	1	106.1			3	373.4			5	549.2
	P											4	707.2
	S	32	3873.0					4				32	3873.0
	TR	8	247.4					296	25299.0	17	1837.0	12	426.2
	ALL	252	41116.0	16	601.2	14	1918.0					595	70772.0
95	H	200	25579.0	26	554.5	44	4858.0	259	27156.0	36	2052.0	565	60199.0
	L	5	655.2					1	490.9	4	392.1	10	1538.0
	P	13	4935.0									13	4935.0
	S	11	151.8	2	8.0							11	151.8
	TR	1	5.2			44	4858.0	261	27648.0	40	2444.0	3	13.2
	ALL	230	31326.0	26	562.5							603	66838.0

Table 2 (cont.)

Banded rudderfish													
Year	Gear	Florida (east)		Florida (west)		Georgia		North Carolina		South Carolina		ALL	
		n	lbs	n	lbs	n	lbs	n	lbs	n	lbs	n	lbs
92	H	8	2084.0	2	44.7			77	3028.0	4	1531.0	91	6687.0
	L									1			7.3
	P	1	7.3										
	S												
	TR												
93	ALL	9	2091.0	2	44.7			77	3028.0	4	1531.0	92	6694.0
	H	47	1418.0	5	742.6			122	7528.0	4	141.5	178	9830.0
	L	1	22.9					3	166.4	1	47.8	5	237.1
	P												
	S							2	136.2			2	136.2
94	TR							127	7830.0	5	189.3	185	10203.0
	ALL	48	1441.0	5	742.6								
	H	46	2455.0	3	122.7	3	162.2	137	11482.0	12	1936.0	201	16158.0
	L							4	704.1	1	21.8	5	725.9
	P												
95	S							3	56.1			3	56.1
	TR							145	12270.0	13	1958.0	210	16968.0
	ALL	46	2455.0	3	122.7	3	162.2						
	H	36	1675.0	12	801.9	5	333.9	182	14948.0	17	1418.0	252	19176.0
	L									3	311.9	3	311.9
	P	3	78.0									3	78.0
	S												
	TR												
	ALL	39	1753.0	12	801.9	5	333.9	182	14948.0	20	1730.0	258	19566.0

Table 3. Estimated recreational catches (numbers) of minor amberjack species from the Atlantic Ocean group, 1981-1995.

a. Lesser amberjack

Source	Group	Species	Year	Catch (Nos.)	Var(Catch) (10,000s)	Yield(lbs)
MRFSS	S. Atlantic	Lesser AJ	1981	0		
MRFSS	S. Atlantic	Lesser AJ	1982	1461	213	
MRFSS	S. Atlantic	Lesser AJ	1983	0		
MRFSS	S. Atlantic	Lesser AJ	1984	1332	69	
MRFSS	S. Atlantic	Lesser AJ	1985	577	33	
MRFSS	S. Atlantic	Lesser AJ	1986	0		
MRFSS	S. Atlantic	Lesser AJ	1987	16		
MRFSS	S. Atlantic	Lesser AJ	1988	487	12	
MRFSS	S. Atlantic	Lesser AJ	1989	0		
MRFSS	S. Atlantic	Lesser AJ	1990	0		
MRFSS	S. Atlantic	Lesser AJ	1991	0		
MRFSS	S. Atlantic	Lesser AJ	1992	1716	294	
MRFSS	S. Atlantic	Lesser AJ	1993	4032	213	
MRFSS	S. Atlantic	Lesser AJ	1994	1456	202	

HBT	S. Atlantic	Lesser AJ	1988	28		66
HBT	S. Atlantic	Lesser AJ	1989			
HBT	S. Atlantic	Lesser AJ	1990			
HBT	S. Atlantic	Lesser AJ	1991	7		11
HBT	S. Atlantic	Lesser AJ	1992	1692		2397
HBT	S. Atlantic	Lesser AJ	1993	2		10
HBT	S. Atlantic	Lesser AJ	1994	24		64
HBT	S. Atlantic	Lesser AJ	1995	7		21

MRFSS	N of NC	Lesser Aj	1983	5395	1377	
MRFSS	N of NC	Lesser Aj	1984			
MRFSS	N of NC	Lesser Aj	1985	1046	57	

Table 3 (cont.)

Source	Group	Species	Year	Catch (Nos.)	Var(Catch) (10,000s)	Yield(lbs)
MRFSS+HBT	S. Atlantic	Lesser AJ	1981	0		
MRFSS+HBT	S. Atlantic	Lesser AJ	1982	1461	213	
MRFSS+HBT	S. Atlantic	Lesser AJ	1983	0		
MRFSS+HBT	S. Atlantic	Lesser AJ	1984	1332	69	
MRFSS+HBT	S. Atlantic	Lesser AJ	1985	577	33	
MRFSS+HBT	S. Atlantic	Lesser AJ	1986	0		
MRFSS+HBT	S. Atlantic	Lesser AJ	1987	16	0	
MRFSS+HBT	S. Atlantic	Lesser AJ	1988	515	12	
MRFSS+HBT	S. Atlantic	Lesser AJ	1989	0		
MRFSS+HBT	S. Atlantic	Lesser AJ	1990	0		
MRFSS+HBT	S. Atlantic	Lesser AJ	1991	7	0	
MRFSS+HBT	S. Atlantic	Lesser AJ	1992	3408	294	
MRFSS+HBT	S. Atlantic	Lesser AJ	1993	4034	213	
MRFSS+HBT	S. Atlantic	Lesser AJ	1994	1480	202	
MRFSS+HBT	S. Atlantic	Lesser AJ	1995	7	0	

b. Almaco jack

Source	Group	Species	Year	Catch (Nos.)	Var(Catch) (10,000s)	Yield(lbs)
MRFSS	S. Atlantic	Almaco	1981	28752	34662	
MRFSS	S. Atlantic	Almaco	1982	0		
MRFSS	S. Atlantic	Almaco	1983	1526	95	
MRFSS	S. Atlantic	Almaco	1984	10655	7572	
MRFSS	S. Atlantic	Almaco	1985	4626	1575	
MRFSS	S. Atlantic	Almaco	1986	0		
MRFSS	S. Atlantic	Almaco	1987	277	2	
MRFSS	S. Atlantic	Almaco	1988	0		
MRFSS	S. Atlantic	Almaco	1989	0		
MRFSS	S. Atlantic	Almaco	1990	0		
MRFSS	S. Atlantic	Almaco	1991	0		
MRFSS	S. Atlantic	Almaco	1992	2683	96	
MRFSS	S. Atlantic	Almaco	1993	1788	203	

Table 3 (cont.)

Source	S. Atlantic	Species	Year	Catch (Nos.)	Var(Catch) (10,000s)	Yield(lbs)
MRFSS	S. Atlantic	Almaco	1994	7755	519	
MRFSS	S. Atlantic	Almaco	1995	3289	661	

HBT	S. Atlantic	Almaco	1986	1623		4899
HBT	S. Atlantic	Almaco	1987	2101		10871
HBT	S. Atlantic	Almaco	1988	1197		13913
HBT	S. Atlantic	Almaco	1989	1569		3812
HBT	S. Atlantic	Almaco	1990	814		2760
HBT	S. Atlantic	Almaco	1991	2132		17189
HBT	S. Atlantic	Almaco	1992	2135		20179
HBT	S. Atlantic	Almaco	1993	3529		32029
HBT	S. Atlantic	Almaco	1994	3996		25926
HBT	S. Atlantic	Almaco	1995	4624		35393

MRFSS	N of NC	Almaco	1986	5537	1235	
MRFSS	N of NC	Almaco	1987	0		
MRFSS	N of NC	Almaco	1988	0		
MRFSS	N of NC	Almaco	1989	0		
MRFSS	N of NC	Almaco	1990	0		
MRFSS	N of NC	Almaco	1991	0		
MRFSS	N of NC	Almaco	1992	0		
MRFSS	N of NC	Almaco	1993	149	2	

MRFSS+HBT	S. Atlantic	Almaco	1981	28752	34662	
MRFSS+HBT	S. Atlantic	Almaco	1982	0		
MRFSS+HBT	S. Atlantic	Almaco	1983	1526	95	
MRFSS+HBT	S. Atlantic	Almaco	1984	10655	7572	
MRFSS+HBT	S. Atlantic	Almaco	1985	4626	1575	
MRFSS+HBT	S. Atlantic	Almaco	1986	1623		
MRFSS+HBT	S. Atlantic	Almaco	1987	2378	2	
MRFSS+HBT	S. Atlantic	Almaco	1988	1197		
MRFSS+HBT	S. Atlantic	Almaco	1989	1569		
MRFSS+HBT	S. Atlantic	Almaco	1990	814		

Table 3 (cont.)

Source	Group	Species	Year	Catch (Nos.)	Var(Catch) (10,000s)	Yield(lbs)
MRFSS+HBT	S. Atlantic	Almaco	1991	2132		
MRFSS+HBT	S. Atlantic	Almaco	1992	4818	96	
MRFSS+HBT	S. Atlantic	Almaco	1993	5312	203	
MRFSS+HBT	S. Atlantic	Almaco	1994	11771	519	
MRFSS+HBT	S. Atlantic	Almaco	1995	7913	661	

c. Banded rudderfish

Source	Group	Species	Year	Catch (Nos.)	Var(Catch) (10,000s)	Yield (lbs)
MRFSS	S. Atlantic	B.Rudderfish	1981	0		
MRFSS	S. Atlantic	B.Rudderfish	1982	0		
MRFSS	S. Atlantic	B.Rudderfish	1983	0		
MRFSS	S. Atlantic	B.Rudderfish	1984	0		
MRFSS	S. Atlantic	B.Rudderfish	1985	0		
MRFSS	S. Atlantic	B.Rudderfish	1986	91907	399268	
MRFSS	S. Atlantic	B.Rudderfish	1987	282	4	
MRFSS	S. Atlantic	B.Rudderfish	1988	160016	373187	
MRFSS	S. Atlantic	B.Rudderfish	1989	0		
MRFSS	S. Atlantic	B.Rudderfish	1990	0		
MRFSS	S. Atlantic	B.Rudderfish	1991	0		
MRFSS	S. Atlantic	B.Rudderfish	1992	0		
MRFSS	S. Atlantic	B.Rudderfish	1993	937	10	
MRFSS	S. Atlantic	B.Rudderfish	1994	0		
MRFSS	S. Atlantic	B.Rudderfish	1995	717	11	
MRFSS	N of NC	B.Rudderfish	1981	538	15	
MRFSS	N of NC	B.Rudderfish	1982	1586	251	
MRFSS	N of NC	B.Rudderfish	1983	0		
MRFSS	N of NC	B.Rudderfish	1984	7790	1523	
MRFSS	N of NC	B.Rudderfish	1985	1469	216	
MRFSS	N of NC	B.Rudderfish	1986	98647	901930	
MRFSS	N of NC	B.Rudderfish	1987	0		

Table 3 (cont.)

Source	Group	Species	Year	Catch (Nos.)	Var(Catch) (10,000s)	Yield (lbs)
MRFSS	N of NC	B.Rudderfish	1988	2360	348	
MRFSS	N of NC	B.Rudderfish	1989	7621	1804	
MRFSS	N of NC	B.Rudderfish	1990	1283	41	
MRFSS	N of NC	B.Rudderfish	1991	6309	806	
MRFSS	N of NC	B.Rudderfish	1992	0		
MRFSS	N of NC	B.Rudderfish	1993	94806	56906	

HBT	S. Atlantic	B.Rudderfish	1986	2		4
HBT	S. Atlantic	B.Rudderfish	1987	1		
HBT	S. Atlantic	B.Rudderfish	1988	1		
HBT	S. Atlantic	B.Rudderfish	1989	144		218
HBT	S. Atlantic	B.Rudderfish	1990	25		60
HBT	S. Atlantic	B.Rudderfish	1991	57		79
HBT	S. Atlantic	B.Rudderfish	1992	2297		4342
HBT	S. Atlantic	B.Rudderfish	1993	6778		27500
HBT	S. Atlantic	B.Rudderfish	1994	6806		21583
HBT	S. Atlantic	B.Rudderfish	1995	5598		26973

MRFSS+HBT	S. Atlantic	B.Rudderfish	1986	91907	399268	
MRFSS+HBT	S. Atlantic	B.Rudderfish	1987	283	4	
MRFSS+HBT	S. Atlantic	B.Rudderfish	1988	160017	373187	
MRFSS+HBT	S. Atlantic	B.Rudderfish	1989	144		
MRFSS+HBT	S. Atlantic	B.Rudderfish	1990	25		
MRFSS+HBT	S. Atlantic	B.Rudderfish	1991	57		
MRFSS+HBT	S. Atlantic	B.Rudderfish	1992	2297		
MRFSS+HBT	S. Atlantic	B.Rudderfish	1993	7715	10	
MRFSS+HBT	S. Atlantic	B.Rudderfish	1994	6806		
MRFSS+HBT	S. Atlantic	B.Rudderfish	1995	6315	11	

Table 3 (cont.)

d. Amberine

Source	Group	Species	Year	Catch (Nos.)	Var(Catch) (10,000s)	Yield (lbs)
HBT	S.Atlantic	Amberine	1986	10001		138012
HBT	S.Atlantic	Amberine	1987	16859		116693
HBT	S.Atlantic	Amberine	1988	3299		14952
HBT	S.Atlantic	Amberine	1989	5672		17141
HBT	S.Atlantic	Amberine	1990	3620		9301

e. Jacks

Source	Group	Species	Year	Catch (Nos.)	Var(Catch) (10,000s)	Source
MRFSS	S.Atlantic	Jacks	1981	4752	2188	
MRFSS	S.Atlantic	Jacks	1982	91623	142835	
MRFSS	S.Atlantic	Jacks	1983	106373	208797	
MRFSS	S.Atlantic	Jacks	1984	14793	2822	
MRFSS	S.Atlantic	Jacks	1985	11511	5378	
MRFSS	S.Atlantic	Jacks	1986	2833	188	
MRFSS	S.Atlantic	Jacks	1987	1851	343	
MRFSS	S.Atlantic	Jacks	1988	6168	910	
MRFSS	S.Atlantic	Jacks	1989	33995	61311	
MRFSS	S.Atlantic	Jacks	1990	1296	168	
MRFSS	S.Atlantic	Jacks	1991	9823	2546	
MRFSS	S.Atlantic	Jacks	1992	4831	618	
MRFSS	S.Atlantic	Jacks	1993	52305	34665	
MRFSS	S.Atlantic	Jacks	1994	12131	2582	
MRFSS	S.Atlantic	Jacks	1995	2054	422	

Table 4. Estimated recreational catches (numbers) of the minor amberjack species in the Atlantic Ocean by fishery and state, 1981-1995.

a. Lesser Amberjack

Year	Fishery	FLE	GA	SC	NC	All states
1982	Private	1461				1461
	All modes	1461				1461
1984	Headboat				1332	1332
	All modes				1332	1332
1985	Headboat				577	577
	All modes				577	577
1987	Charter				16	16
	All modes				16	16
1988	Headboat	28				28
	Private				487	487
	All modes	28			487	515
1991	Headboat	1			6	7
	All modes	1			6	7
1992	Headboat	1692				1692
	Private	1716				1716
	All modes	3408				3408
1993	Shore				1899	1899
	Headboat	2				2
	Charter	1637			496	2133
	All modes	1639			496	4034
1994	Charter	1422		34		1456
	Headboat	23		1		24
	All modes	1445		35		1480

b. Almaco Jack

Year	Fishery	FLE	GA	SC	NC	All states
1981	Shore		14163			14163
	Headboat	587				587
	Private		14002			14002
	All modes	587	28165			28752

Table 4 (cont.)

Year	Fishery	FLE	GA	SC	NC	All states
1983	Private	1526				1526
	All modes	1526				1526
1984	Private	10655				10655
	All modes	10655				10655
1985	Shore	3950				3950
	Headboat	676				676
	All modes	4626				4626
1986	Headboat	1549		13	61	1623
	All modes	1549		13	61	1623
1987	Headboat	1403		584	114	2101
	Private				277	277
	All modes	1403		584	391	2378
1988	Headboat	442		713	42	1197
	All modes	442		713	42	1197
1989	Headboat	1400		169		1569
	All modes	1400		169		1569
1990	Headboat	598		143	73	814
	All modes	598		143	73	814
1991	Headboat	1546		353	233	2132
	All modes	1546		353	233	2132
1992	Headboat	1272		283	580	2135
	Charter	370	234			604
	Private	2079				2079
	All modes	3721	234	283	580	4818
1993	Charter	1788				1788
	Headboat	1843		2089	582	3529
	All modes	2646		2089	582	5317
1994	Charter	6963	37			7000
	Private	755				755
	Headboat	1843	7	1754	392	3966
	All modes	9561	44	1754	392	11751
1995	Charter	525	205			730
	Headboat	1384	3	2317	920	4624
	Private	2559				2559
	All modes	4468	208	2317	920	7913

Table 4 (cont.)

c. Banded Rudderfish

Year	Fishery	FLE	GA	SC	NC	All states
1986	Shore				91907	91907
	Headboat	2				2
	All modes	2			91907	91909
1987	Headboat	1				1
	Private				282	282
	All modes	1			282	283
1988	Shore				160016	160016
	Headboat	1				1
	All modes	1			160016	160017
1989	Headboat	144				144
	All modes	144				144
1990	Headboat	25				25
	All modes	25				25
1991	Headboat	57				57
	All modes	57				57
1992	Headboat	1387		910		2297
	All modes	1387		910		2297
1993	Private				937	937
	Headboat	1350		5311	117	6778
	All modes	1350		5311	1054	7715
1995	Shore				445	445
	Charter		272			272
	Headboat		275	4629	73	5598
	All modes		275	4629	518	6315

Table 5. Summary biometric information by sample source for sample average weight and length of other *Seriola* species in the Atlantic Ocean group.

a. Lesser amberjack						
Region	Source	Year	Sample length (cm)		Sample weight (lbs)	
			Mean	N	Mean	N
Mid Atlantic	Rec MRFSS	1983	27.35	2	0.88	2
		1985	28.00	1	1.10	1
	Rec All	1983	27.35	2	0.88	2
		1985	28.00	1	1.10	1
South Atlantic	Rec MRFSS	1984	54.70	1		
		1993	28.96	14	2.76	2
	Rec Headboat	1979	37.07	9	3.45	5
		1982	79.04	4	12.28	3
		1984	48.80	1	4.62	1
		1986	46.73	3	3.63	3
		1987	36.37	8	4.84	3
		1988	27.17	1		
		1989	67.56	7	14.13	6
		1990	32.92	15		
		1991	35.26	27	5.02	1
		1992	19.50	27	3.86	4
		1993	47.72	5	7.69	3
		1994	46.74	9	4.85	6
		1995	44.66	10	3.32	8
	Rec Tip-len	1992	43.50	2		
	Rec All	1979	37.07	9	3.45	5
		1982	79.04	4	12.28	3
		1984	51.75	2	4.62	1
		1986	46.73	3	3.63	3
		1987	36.37	8	4.84	3
		1988	27.17	1		
		1989	67.56	7	14.13	6
		1990	32.92	15		
		1991	35.26	27	5.02	1
		1992	21.15	29	3.86	4
		1993	33.90	19	5.72	5
		1994	46.74	9	4.85	6
		1995	44.66	10	3.32	8
South Atlantic	Com Tip-len	1985	41.97	3		
		1986	50.14	7		
		1987	54.67	3		
		1989	53.00	3		
		1990	57.00	1		
		1992	40.48	91		
		1993	55.12	37		
		1994	47.89	70		
		1995	56.46	37		
	Com Tip-wt	1985			10.49	2
		1986			8.60	1
		1987			7.28	2
		1989			5.29	9
		1990			3.97	1

Table 5 (cont.)

Region	Source	Year	Sample length (cm)		Sample weight (lbs)	
			Mean	N	Mean	N
South Atlantic	Com Tip-wt.	1992			11.18	5
		1993			12.13	1
		1994			6.73	6
		1995			6.47	12
	Com All	1985	41.97	3	10.49	2
		1986	50.14	7	8.60	1
		1987	54.67	3	7.28	2
		1989	53.00	3	5.29	9
South Pacific	Com All	1990	57.00	1	3.97	1
		1992	40.48	91	11.18	5
		1993	55.12	37	12.13	1
		1994	47.89	70	6.73	6
		1995	56.46	37	6.47	12

b. Almaco

Region	Source	Year	Sample length (cm)		Sample weight (lbs)	
			Mean	N	Mean	N
Mid Atlantic	Rec MRFSS	1986	23.27	3	0.44	3
	Rec All	1986	23.27	3	0.44	3
South Atlantic	Rec MRFSS	1981	19.33	11		
		1983	33.50	1		
		1984	32.40	5	2.87	1
		1985	42.75	2	6.61	1
		1987	67.00	1	10.36	1
		1992	30.37	3		
		1993	40.00	1		
		1994	33.10	8	13.67	2
		1995	37.90	2		
	Rec Headboat	1979	46.34	11	7.76	7
		1980	55.71	15	11.04	11
		1981	51.99	29	6.97	24
		1982	56.17	27	15.45	15
		1983	56.14	43	11.90	30
		1984	54.55	35	10.30	22
		1985	40.08	62	9.49	17
		1986	40.01	49	10.54	13
		1987	54.55	39	10.21	28
		1988	65.99	21	13.99	17
		1989	44.38	37	10.31	16
	Rec Tip-len	1990	49.50	36	9.30	21
		1991	56.62	27	10.40	19
		1992	64.88	54	13.50	43
		1993	59.63	98	10.34	81
		1994	57.12	118	9.14	85
		1995	59.90	106	9.31	92

Table 5 (cont.)

Region	Source	Year	Sample length (cm)		Sample weight (lbs)	
			Mean	N	Mean	N
South Atlantic	Rec BNP	1983	34.00	2		
		1988	26.67	3		
		1989	31.50	4		
	Rec Tip-wt	1984			11.14	4
		1985			12.18	2
		1986			2.65	1
		1987			8.37	1
		1990			6.26	1
		1992			9.92	1
	Rec All	1979	46.34	11	7.76	7
		1980	55.71	15	11.04	11
		1981	43.01	40	6.97	24
		1982	56.17	27	15.45	15
		1983	54.68	46	11.90	30
		1984	51.78	40	10.15	27
		1985	42.13	70	9.62	20
		1986	40.08	50	9.97	14
		1987	55.18	42	10.15	30
		1988	61.07	24	13.99	17
		1989	43.13	41	10.31	16
		1990	49.50	36	9.16	22
		1991	56.62	27	10.40	19
		1992	63.07	57	13.42	44
		1993	61.26	113	10.34	81
		1994	56.32	130	9.25	87
		1995	59.27	109	9.31	92
South Atlantic	Com Tip-len	1985	79.22	69		
		1986	66.00	31		
		1987	72.55	75		
		1988	67.87	24		
		1989	66.70	55		
		1990	73.87	73		
		1991	68.36	103		
		1992	58.83	101		
		1993	68.51	312		
		1994	65.94	326		
	Com Tip-wt	1984			10.78	1
		1985			14.73	17
		1986			11.05	5
		1987			15.19	17
		1988			11.52	23
		1989			12.61	47
		1990			13.34	48
		1991			11.55	58

Table 5 (cont.)

Region	Source	Year	Sample length (cm)		Sample weight (lbs)	
			Mean	N	Mean	N
South Atlantic	Com All	1984			10.78	1
		1985	79.22	69	14.73	17
		1986	66.00	31	11.05	5
		1987	72.55	75	15.19	17
		1988	67.87	24	11.52	23
		1989	66.70	55	12.61	47
		1990	73.87	73	13.34	48
		1991	68.36	103	11.55	58
		1992	58.83	101	11.75	35
		1993	68.51	312	11.70	57
		1994	65.94	326	11.41	75
		1995	65.67	716	11.67	91

c. Banded rudderfish

Region	Source	Year	Sample length (cm)		Sample weight (lbs)	
			Mean	N	Mean	N
Mid Atlantic	Rec MRFSS	1982	18.00	1	0.22	1
		1984	23.16	5	0.48	5
		1985	17.00	1	0.22	1
		1986	21.86	11	0.58	11
		1989			0.55	4
		1990	20.90	1	0.22	1
		1991	24.26	7	0.47	7
		1993	22.48	25	0.51	25
	Rec All	1982	18.00	1	0.22	1
		1984	23.16	5	0.48	5
		1985	17.00	1	0.22	1
		1986	21.86	11	0.58	11
South Atlantic	Rec MRFSS	1989			0.55	4
		1990	20.90	1	0.22	1
		1991	24.26	7	0.47	7
		1993	22.48	25	0.51	25
	Rec Headboat	1987	26.50	1		
		1988	17.94	25		
		1993	30.10	3		
		1995	21.95	2		
		1979	50.31	9	7.00	7
		1980	64.39	11	8.37	10
		1983	36.57	8	3.37	3
		1984	52.29	67	5.94	53
		1985	37.69	31	4.33	6
		1986	40.48	9	5.17	2
		1987	30.69	8	6.16	1

Table 5 (cont.)

Region	Source	Year	Sample length (cm)		Sample weight (lbs)	
			Mean	N	Mean	N
South Atlantic	Rec Tip-len	1985	51.50	1		
		1986	39.93	7		
		1993	50.57	23		
	Rec Tip-wt	1985			5.07	1
	Rec All	1979	50.31	9	7.00	7
		1980	64.39	11	8.37	10
		1983	36.57	8	3.37	3
		1984	52.29	67	5.94	53
		1985	38.12	32	4.43	7
		1986	40.24	16	5.17	2
		1987	30.23	9	6.16	1
		1988	19.06	27		
		1989	25.00	1		
		1990	34.10	2		
		1991	48.78	4	22.83	1
		1992	40.27	18	4.22	4
		1993	46.51	161	5.58	76
		1994	43.54	116	4.67	60
		1995	46.29	127	5.46	71
Com	Tip-len	1985	60.98	40		
		1987	54.36	25		
		1988	44.86	7		
		1989	52.44	9		
		1990	52.65	12		
		1991	42.83	24		
		1992	61.28	9		
		1993	56.23	37		
		1994	52.98	25		
		1995	50.14	117		
Com	Tip-wt	1985			8.26	8
		1987			6.95	4
		1988			7.69	3
		1989			5.62	7
		1990			4.97	6
		1991			6.38	9
		1992			3.50	3
		1993			6.66	11
		1994			8.92	19
		1995			5.12	16
Com	All	1985	60.98	40	8.26	8
		1987	54.36	25	6.95	4
		1988	44.86	7	7.69	3
		1989	52.44	9	5.62	7
		1990	52.65	12	4.97	6
		1991	42.83	24	6.38	9
		1992	61.28	9	3.50	3
		1993	56.23	37	6.66	11
		1994	52.98	25	8.92	19
		1995	50.14	117	5.12	16

Table 6. Summary biometric information for sample average weight and length of the minor amberjack species in the Atlantic Ocean region for all sources combined.

a. Lesser amberjack

Region	Fishery	Year	Sample length (cm)			Sample weight (lbs)		
			Mean	Variance	N	Mean	Variance	N
Mid Atlantic	Recreational	1983	27.35	0.02	2	0.88	0.00	2
		1985	28.00		1	1.10	0.00	1
South Atlantic	Recreational	1984	54.70		1			0
		1992	43.50	0.25	2			0
		1993	28.96	2.15	14	2.76	0.01	2
South Atlantic	Commercial	1985	41.97	35.68	3	10.49	22.63	2
		1986	50.14	8.39	7	8.60	0.00	1
		1987	54.67	36.78	3	7.28	0.05	2
		1989	53.00	60.75	3	5.29	0.51	9
		1990	57.00		1	3.97	0.00	1
		1992	40.48	5.65	91	11.18	15.89	5
		1993	55.12	3.86	37	12.13	0.00	1
		1994	47.89	1.51	70	6.73	6.12	6
		1995	56.46	3.13	37	6.47	0.56	12
South Atlantic	Headboat	1974	64.36	75.81	7	14.14	13.01	5
		1976	58.56	63.66	4	8.21	10.22	4
		1977	55.81	30.25	2	6.49	0.25	2
		1978	74.95		1	14.85	0.00	1
		1979	37.07	5.47	9	3.45	0.02	5
		1982	79.04	140.67	4	12.28	11.17	3
		1984	48.80		1	4.62	0.00	1
		1986	46.73	0.17	3	3.63	0.05	3
		1987	36.37	33.71	8	4.84	0.06	3
		1988	27.17		1			0
		1989	67.56	156.60	7	14.13	23.83	6
		1990	32.92	1.47	15			0
		1991	35.26	1.04	27	5.02	0.00	1
		1992	19.50	0.94	27	3.86	0.42	4
		1993	47.72	79.62	5	7.69	5.27	3
		1994	46.74	9.23	9	4.85	0.34	6
		1995	44.66	2.42	10	3.32	0.04	8

b. Almaco jack

Region	Fishery	Year	Sample length (cm)			Sample weight (lbs)		
			Mean	Variance	N	Mean	Variance	N
Mid Atlantic	Recreational	1986	23.27	14.96	3	0.44	0.05	3
South Atlantic	Recreational	1981	18.16	3.28	10			
		1983	33.83	0.03	3			
		1984	32.40	5.26	5	9.49	7.98	5
		1985	58.06	73.60	8	10.33	3.98	3
		1986	43.60		1	2.65	0.00	1
		1987	63.33	10.11	3	9.37	0.99	2
		1988	26.67	7.11	3			
		1989	31.50	13.75	4			
		1990				6.26	0.00	1
		1992	30.37	4.30	3			
		1993	71.93	9.19	15			
		1994	48.40	52.54	12	13.67	25.71	2
		1995	36.93	1.34	3			

Table 6 (cont.)

Region	Fishery	Year	Sample length (cm)			Sample weight (lbs)		
			Mean	Variance	N	Mean	Variance	N
South Atlantic	Commercial	1984				10.78		1
		1985	79.22	1.92	69	14.73	3.70	17
		1986	66.00	7.37	31	11.05	2.67	5
		1987	72.55	5.10	75	15.19	10.98	17
		1988	67.88	11.54	24	11.52	1.82	23
		1989	66.70	5.14	55	12.61	0.68	47
		1990	73.87	1.99	73	13.35	0.45	48
		1991	68.36	2.53	103	11.55	0.47	58
		1992	58.83	3.89	101	11.75	1.58	35
		1993	68.51	0.78	312	11.70	0.53	57
		1994	65.94	0.77	326	11.41	0.36	75
		1995	65.67	0.36	716	11.67	0.34	91
South Atlantic	Headboat	1973	68.14	2.91	33	11.88	0.62	33
		1974	77.51	8.83	30	16.29	3.51	27
		1975	64.56	24.12	20	12.90	4.84	19
		1976	74.64	6.35	34	15.80	0.97	33
		1977	79.15	11.25	36	19.17	3.90	33
		1978	58.55	4.77	77	11.42	1.55	59
		1979	46.34	31.59	11	7.76	7.06	7
		1980	55.71	24.20	15	11.04	2.98	11
		1981	51.29	7.22	30	6.97	1.10	24
		1982	56.17	18.44	27	15.45	4.43	15
		1983	56.14	12.37	43	11.90	3.94	30
		1984	54.55	10.22	35	10.30	1.27	22
		1985	40.08	4.29	62	9.49	2.98	17
		1986	40.01	5.56	49	10.54	1.90	13
		1987	54.55	9.50	39	10.21	1.92	28
		1988	65.99	18.72	21	13.99	3.39	17
		1989	44.38	10.23	37	10.31	3.17	16
		1990	49.50	9.79	36	9.30	1.41	21
		1991	56.62	12.08	27	10.40	2.07	19
		1992	64.88	4.26	54	13.50	1.67	43
		1993	59.63	2.37	98	10.34	0.48	81
		1994	57.12	2.38	118	9.14	0.27	85
		1995	59.90	2.12	106	9.31	0.32	92

c. Banded rudderfish

Region	Fishery	Year	Sample length (cm)			Sample weight (lbs)		
			Mean	Variance	N	Mean	Variance	N
Mid Atlantic	Recreational	1982	18.00	0.00	1	0.2205	0	1
		1984	23.16	0.87	5	0.485	0.0019	5
		1985	17.00	0.00	1	0.2205	0	1
		1986	21.86	0.88	11	0.5812	0.0064	11
		1990	20.90	0.00	1	0.2205	0	1
		1991	24.26	1.44	7	0.4724	0.0056	7
		1993	22.97	0.18	16	0.5098	0.0019	16
South Atlantic	Recreational	1985	51.50	0.00	1	5.0706	0	1
		1986	39.93	1.49	7			
		1987	26.50	0.00	1			
		1988	17.94	0.11	25			
		1993	48.20	2.68	26			
		1995	21.95	1.32	2			

Table 6 (cont.)

Region	Fishery	Year	Sample length (cm)			Sample weight (lbs)		
			Mean	Variance	N	Mean	Variance	N
South Atlantic Commercial		1985	60.98	1.42	40	8.26	0.58	8
		1987	54.36	2.83	25	6.95	1.90	4
		1988	44.86	2.89	7	7.69	5.69	3
		1989	52.44	14.96	9	5.62	0.43	7
		1990	52.65	28.50	12	4.97	1.11	6
		1991	42.83	4.50	24	6.38	1.63	9
		1992	61.28	3.20	9	3.50	0.63	3
		1993	56.23	0.37	37	6.66	0.54	11
		1994	52.98	1.60	25	8.92	11.92	19
		1995	50.14	0.38	117	5.12	0.28	16
South Atlantic Headboat		1979	50.31	20.02	9	7.00	1.07	7
		1980	64.39	4.94	11	8.37	0.47	10
		1983	36.57	7.40	8	3.37	0.13	3
		1984	52.29	2.70	67	5.94	0.13	53
		1985	37.69	2.71	31	4.33	0.23	6
		1986	40.48	6.48	9	5.17	0.01	2
		1987	30.69	13.30	8	6.16	0.00	1
		1988	33.02	16.03	2	0.00	0.00	0
		1989	25.00	0.00	1	0.00	0.00	0
		1990	34.10	0.16	2	0.00	0.00	0
		1991	48.78	212.60	4	22.83	0.00	1
		1992	40.27	5.26	18	4.22	1.56	4
		1993	46.18	1.02	135	5.58	0.02	76
		1994	43.54	0.90	116	4.67	0.04	60
		1995	46.68	0.88	125	5.46	0.03	71
Mid Atlantic Headboat		1989	0.00	0.00	0	0.55	0.00	4
		1993	21.62	0.11	9	0.51	0.00	9

Table 7. Observed CPUE (lbs/trip) of the minor amberjack species as reported by commercial logbooks. Number of trips (n) is noted in parenthesis. (*) denotes that some unclassified gears are not included in totals. H = handline, L = longline, P=powerheads, S=spears, and Tr = troll.

Lesser amberjack							
Year	Gear	Florida (east)	Florida (west)	Georgia	North Carolina	South Carolina	ALL*
		lbs	lbs	lbs	lbs	lbs	lbs
92	H	237.0 (8)	34.2 (6)	429.5 (7)	50.0 (81)	83.3 (13)	89.1 (115)
	L				15.6 (1)		15.6 (1)
	P				449.3 (1)		449.3 (1)
	S				53.0 (4)		53.0 (4)
	TR				54.3 (87)		90.2 (121)
	ALL*	237.0 (8)	34.2 (6)	429.5 (7)	83.3 (13)		
93	H	363.2 (47)	48.1 (8)	72.0 (39)	75.4 (123)	113.9 (61)	131.2 (278)
	L	158.1 (1)				86.3 (4)	100.7 (5)
	P						59.0 (4)
	S	59.0 (4)			123.7 (12)		123.7 (12)
	TR				79.7 (135)		129.4 (299)
	ALL*	335.9 (52)	48.1 (8)	72.0 (39)		112.2 (65)	
94	H	439.1 (96)	88.2(12)	118.9 (41)	70.0 (182)	134.6 (78)	174.4 (409)
	L				252.0 (4)	29.6 (2)	177.8 (6)
	P	384.8 (1)					384.8 (1)
	S	71.3 (7)					71.3 (7)
	TR				45.0 (15)		45.0 (15)
	ALL*	413.8 (104)	88.2(12)	118.9 (41)	71.8 (201)	131.9 (80)	168.8 (438)
95	H	264.8 (103)	44.1 (14)	72.4 (63)	76.1 (206)	125.5 (115)	124.9 (501)
	L	40.1 (5)			87.4 (2)		53.6 (7)
	P	77.5 (11)					77.5 (11)
	S	640.1 (2)	10.4 (1)		87.1 (19)		430.2 (3)
	TR	52.0 (1)			77.1 (227)		85.3 (20)
	ALL*	243.1 (122)	41.8 (15)	72.4 (63)		125.5 (115)	123.2 (542)
96	H	66.9 (64)	67.7 (10)	99.3 (36)	76.0 (174)	130.8 (72)	87.6 (356)
	L	26.0 (2)			25.0 (2)	7.3 (2)	19.4 (6)
	P	74.7 (6)					74.7 (6)
	S	3.1 (1)					3.1 (1)
	TR	18.7 (3)	52.0 (1)		48.5 (5)		41.5 (8)
	ALL*	63.7 (76)	66.3 (11)	99.3 (36)	74.6 (181)	127.4 (74)	84.9 (378)
Almaco jack							
Year	Gear	FLE	FLW	GA	NC	SC	ALL*
		lbs	lbs	lbs	lbs	lbs	lbs
92	H	289.8 (70)	690.2 (42)	625.4 (3)	62.3 (72)	144.3 (59)	260.8 (246)
	L	147.3 (19)			176.8 (1)	93.6 (2)	143.8 (22)
	P						
	S	70.0 (8)	165.4 (1)		1165.0 (1)		165.1 (10)
	TR				79.0 (6)	25.0 (2)	65.5 (8)
	ALL*	241.3 (97)	678.0 (43)	625.4 (3)	78.8 (80)	138.9 (63)	243.0 (286)
93	H	110.3 (168)	49.6 (13)	85.3 (18)	85.0 (201)	279.7 (48)	114.4 (448)
	L	63.6 (24)			627.5 (8)		204.6 (32)
	P						
	S	44.6 (13)			81.1 (1)		47.2 (14)
	TR	74.2 (3)			26.9 (13)	111.3 (3)	47.7 (19)
	ALL*	100.1 (209)	49.6 (13)	85.3 (18)	101.1 (223)	269.8 (51)	115.5 (514)
94	H	175.0 (207)	33.0 (15)	137.0 (14)	85.6 (289)	108.1 (17)	120.3 (542)
	L	69.7 (1)	106.1 (1)		124.5 (3)		109.8 (75)
	P	176.8 (4)					176.8 (4)
	S	121.0 (32)					121.0 (32)
	TR	30.9 (8)					30.9 (8)
	ALL*	163.2 (252)	37.6 (16)	137.0 (14)	85.5 (296)	108.1 (17)	118.9 (595)

Table 7. (cont.)

Year	Gear	FLE	FLW	GA	NC	SC	ALL*
		lbs	lbs	lbs	lbs	lbs	lbs
95	H	127.9 (200)	21.3 (26)	110.4 (44)	104.8 (259)	57.0 (36)	106.5 (565)
	L	131.0 (5)			490.9 (1)	98.0 (4)	153.8 (10)
	P	379.6 (13)					379.6 (13)
	S	13.8 (11)		110.4 (44)	13.8 (11)		
	TR	5.2 (1)	4.0 (2)		4.4 (3)		
	ALL*	136.2 (230)	20.1 (28)		110.8 (603)		
96	H	179.3 (98)	39.1 (32)	128.7 (33)	162.1 (88)	93.1 (37)	131.4 (288)
	L	22.9 (1)			195.5 (1)	86.3 (2)	97.7 (4)
	P	139.4 (5)					139.4 (5)
	S	54.1 (2)		128.7 (33)	54.1 (2)		
	TR	27.0 (1)	3.0 (2)		9.1 (6)		
	ALL*	144.7 (107)	36.9 (34)		128.1 (305)		

Banded rudderfish

Year	Gear	FLE	FLW	GA	NC	SC	ALL*
		lbs	lbs	lbs	lbs	lbs	lbs
92	H	260.5 (8)	22.4 (2)		39.3 (77)	382.7 (4)	73.5 (91)
	L						
	P						7.3 (1)
	S	7.3 (1)			39.3 (77)	382.7 (4)	72.8 (92)
	TR						
	ALL*	232.4 (9)	22.4 (2)				
93	H	30.2 (47)	148.5 (5)		61.7 (122)	35.4 (4)	55.2 (178)
	L	22.9 (1)			55.5 (3)	47.8 (1)	47.4 (5)
	P						
	S				68.1 (2)	68.1 (2)	
	TR				61.7 (127)	37.9 (5)	55.2 (185)
	ALL*	30.0 (48)	148.5 (5)				
94	H	53.4 (46)	40.9 (3)	54.1 (3)	83.8 (137)	161.3 (12)	80.4 (201)
	L				176.0 (4)	21.8 (1)	145.2 (5)
	P						
	S			54.1 (3)	18.7 (3)	18.7 (3)	
	TR				84.6 (145)	150.6 (13)	80.8 (210)
	ALL*	53.4 (46)	40.9 (3)				
95	H	46.5 (36)	66.8 (12)	66.8 (5)	82.1 (182)	83.4 (17)	76.1 (252)
	L					104.0 (3)	104.0 (3)
	P	26.0 (3)					26.0 (3)
	S			66.8 (5)	82.1 (182)	86.5 (20)	
	TR						
	ALL*	44.9 (39)	66.8 (12)			75.8 (258)	
96	H	201.8 (26)	51.8 (10)	149.3 (4)	95.4 (53)	78.3 (22)	114.3 (115)
	L					9.4 (1)	9.4 (1)
	P						
	S	5.2 (1)		149.3 (4)	5.2 (1)		
	TR						
	ALL*	194.6 (27)	51.8 (10)		112.5 (117)		

Table 8. Recreational CPUE of the minor amberjack species in the Atlantic Ocean.

Data Source/Fishery					
Lesser amberjack					
	MRFSS			NMFS Headboat ¹	
Year	CPH	CPA	N	CPA	N
1978			0	1.1	137
1979			0	1.4	242
1980			0		0
1981	0.4	1.0	1		0
1982	0.2	4.0	1		0
1983	0.1	0.8	2		0
1984	0.0	0.2	1		0
1985	0.1	1.0	1		0
1986			0		0
1987	0.2	0.8	3		0
1988	0.1	1.0	1	0.6	1
1989	3.7	16.7	1		0
1990			0		0
1991	0.2	1.0	1	0.2	2
1992	0.3	2.0	1	1.3	28
1993	0.4	1.9	11	0.1	1
1994	0.1	0.5	2	0.2	5
1995			0	0.0	2
Total			26		418

Table 8 (cont.)

Data Source/Fishery					
Almaco					
	MRFSS			NMFS Headboat ¹	
Year	CPH	CPA	N	CPA	N
1976			0	0.0	1
1977			0	0.0	1
1978			0	0.0	14
1979			0	0.1	35
1980			0	0.1	63
1981	0.6	1.8	6	0.1	116
1982	0.1	0.7	1	0.2	116
1983	0.0	0.3	1	0.2	138
1984	0.4	2.1	3	0.2	108
1985	0.2	0.9	6	0.1	226
1986	0.4	2.0	1	0.1	364
1987	0.1	0.5	3	0.2	445
1988	0.3	2.0	1	0.1	258
1989	0.6	3.0	1	0.2	187
1990	0.1	0.5	1	0.1	147
1991			0	0.2	210
1992	0.2	0.9	5	0.1	465
1993	0.2	0.9	6	0.2	481
1994	0.3	1.1	8	0.2	587
1995	0.1	0.5	3	0.2	650
Total			46		4612

Table 8(cont.)

Data Source/Fishery					
Banded rudderfish					
	MRFSS			NMFS Headboat ¹	
Year	CPH	CPA	N	CPA	N
1981	0.1	0.3	1		0
1982	0.2	1.0	1		0
1983			0	0.2	2
1984	0.7	4.0	4	0.4	327
1985			0	0.3	446
1986	0.7	4.0	5	0.4	656
1987	0.2	0.5	1	0.5	694
1988	1.4	5.7	6	0.4	197
1989			0	0.4	366
1990			0	0.3	354
1991			0	0.3	169
1992	0.2	1.0	3		
1993	0.6	2.8	8		
1994	0.2	1.0	1		
1995	0.1	0.8	5		
Total			35		3211

CPH = Catch per angler hour

CPA = Catch per angler

N = Number observations

¹NMFS headboat survey began in 1973 in the Carolinas and in 1976 in the Florida Keys.

Table 9. Estimated percent reduction in recreational catch for Almaco jack in the Atlantic Ocean in 1995 for several bag limit options (N = number of observations).

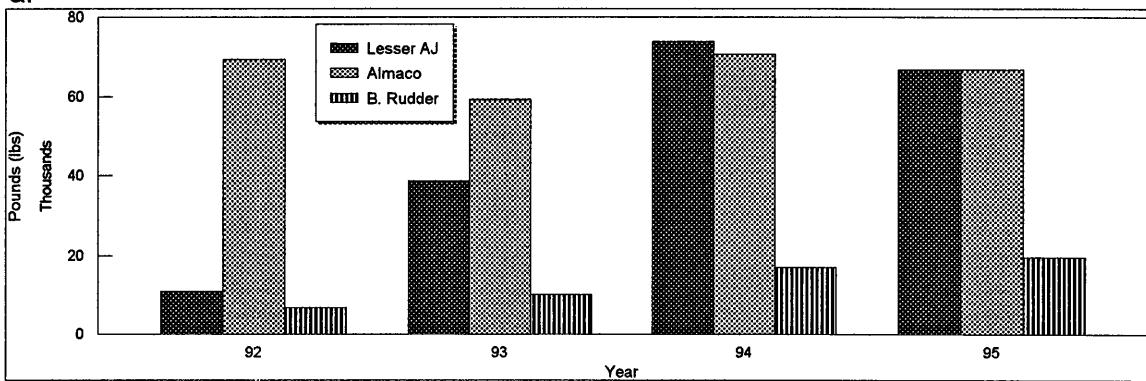
Data Source/Fishery	
Almaco Jack	
Bag Limit	NMFS
Option	Headboat
1	2.9
2	0.0
3	0.0
4	0.0
5	0.0
N	650

Figure 5

Length frequency

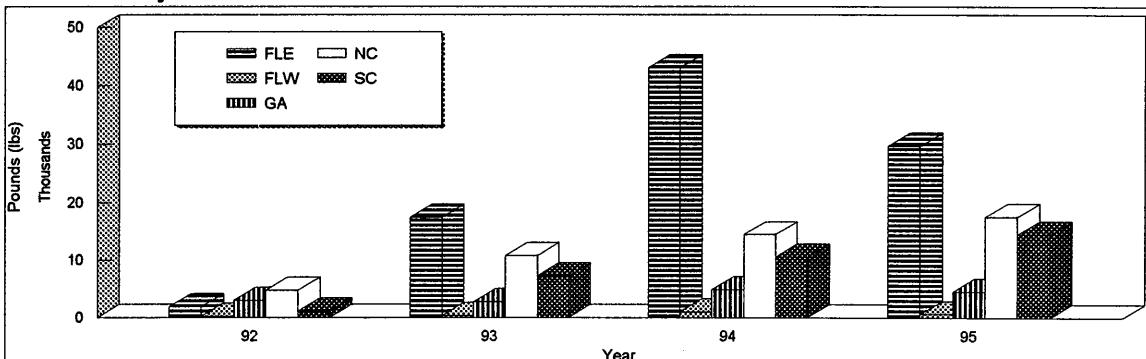
Figure 1. Commercial landings (pounds) of the minor amberjack species as reported from Atlantic logbooks, 1992-1995.

a.

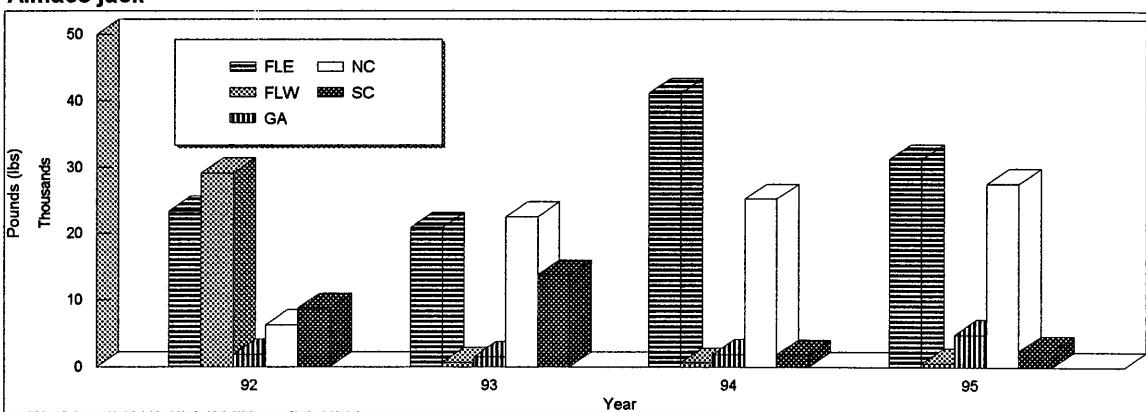


b.

Lesser amberjack



Almaco jack



Banded rudderfish

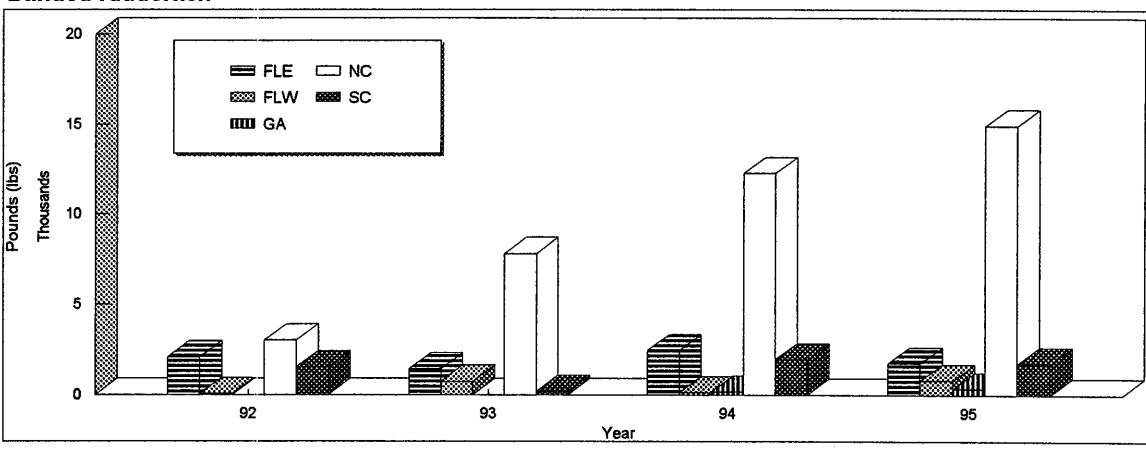


Figure 2. Commercial landings (pounds) of the minor amberjack species by gear used as reported by Atlantic logbooks.

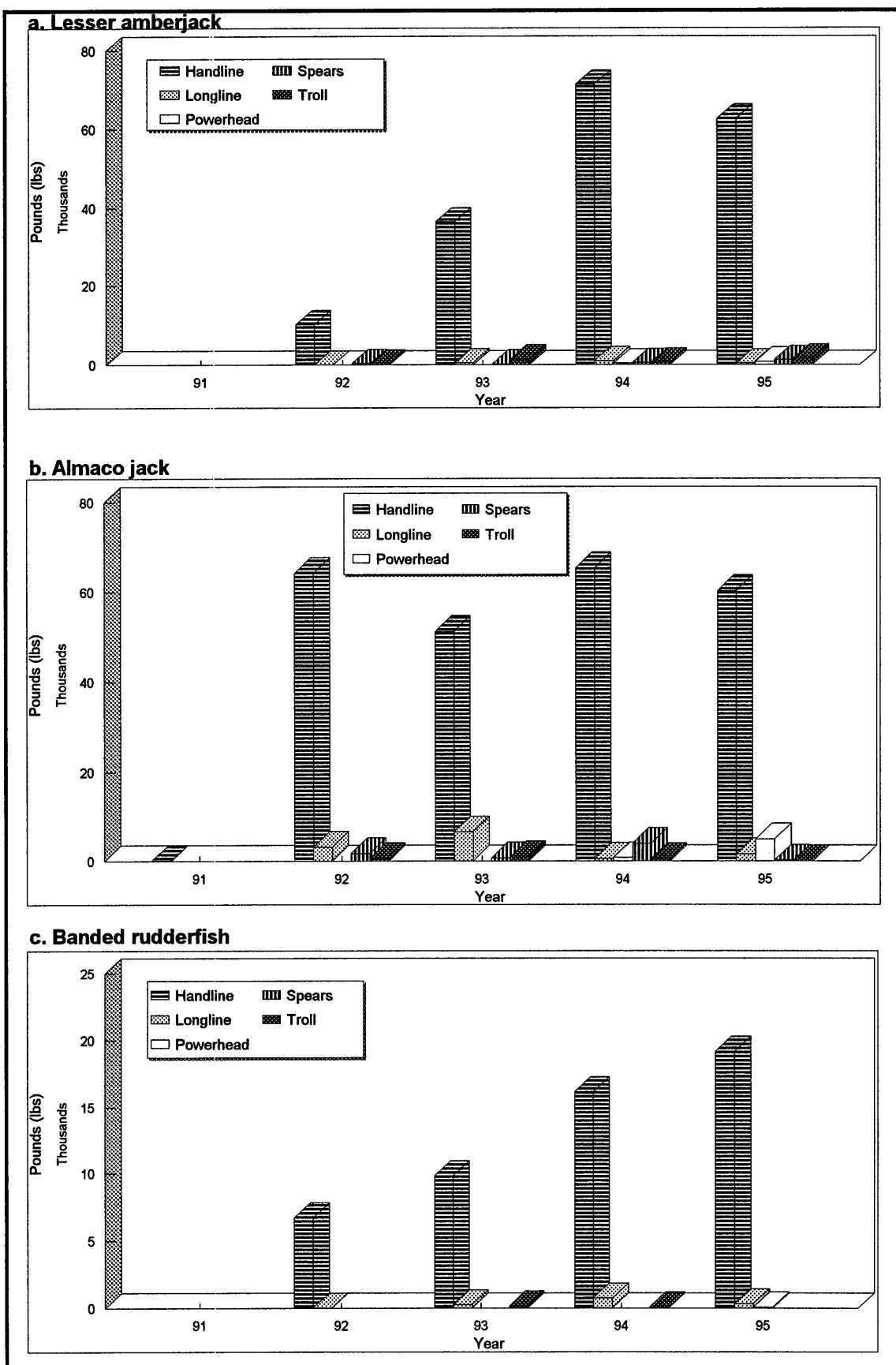


Figure 3. Estimated recreational catch (numbers) by year for minor amberjack species in the Atlantic Ocean.

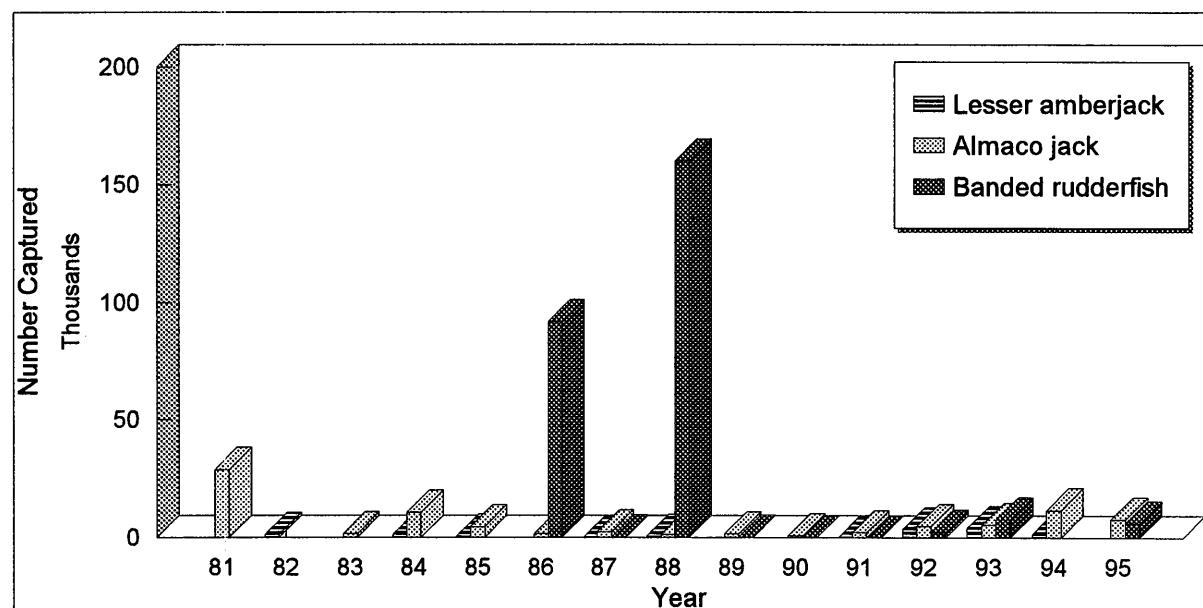


Figure 4. Observed mean length by fishery of the minor amberjack species in the Atlantic Ocean.

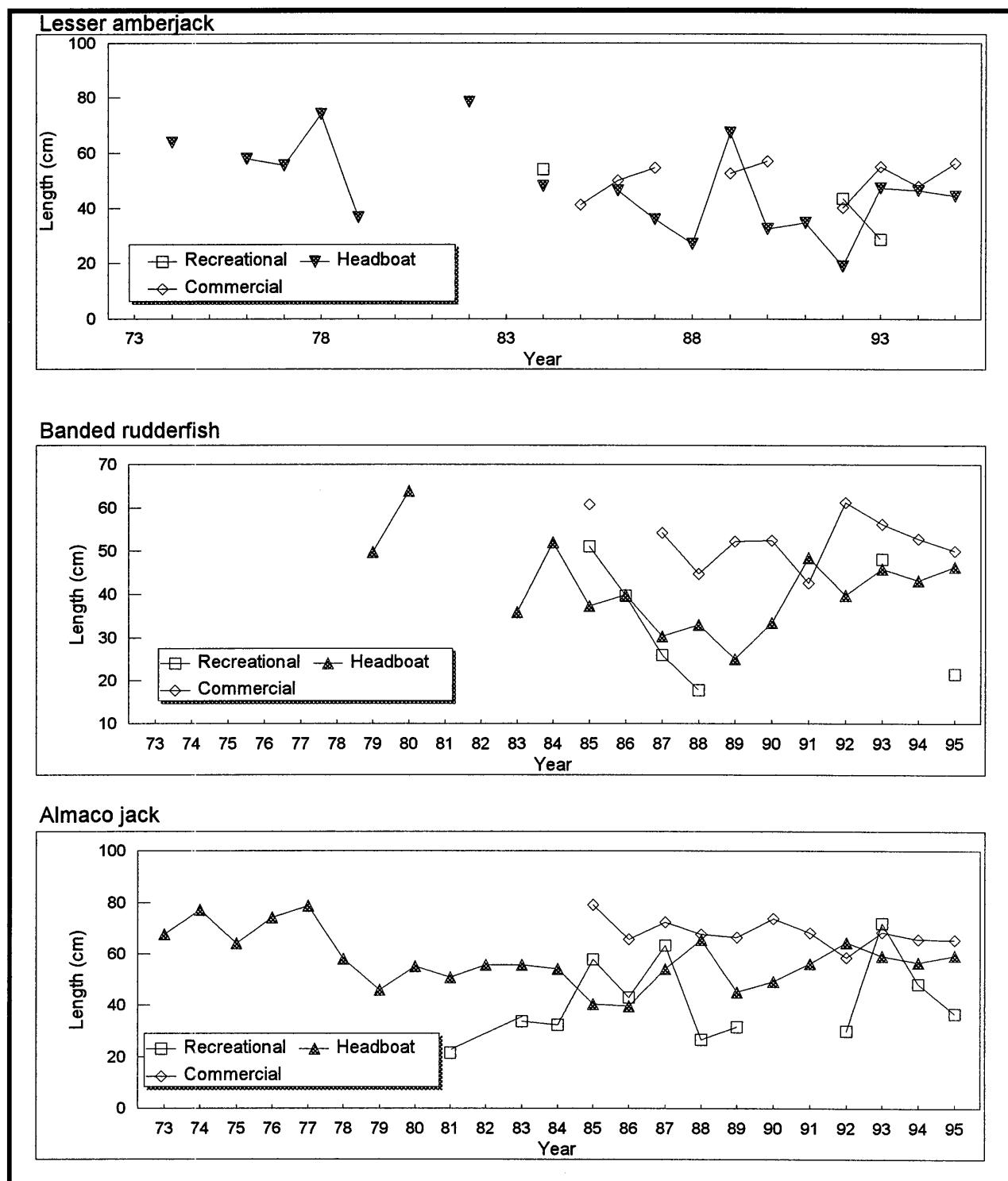


Figure 6. Observed mean weight (lbs.) by fishery of the minor amberjack species in the Atlantic Ocean.

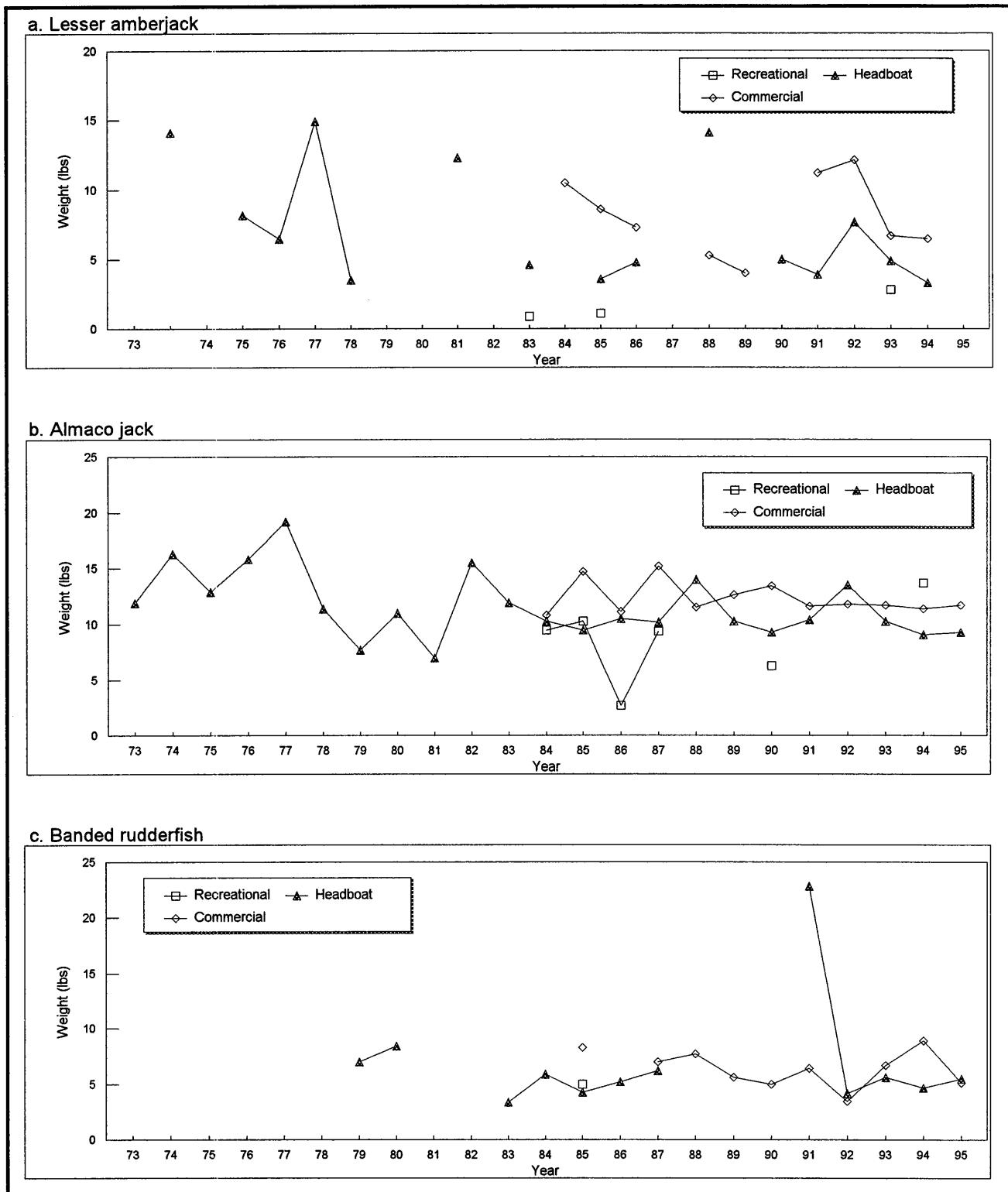


Figure 7. Observed CPUE (lbs/trip) by gear used of the minor amberjack species as reported from logbooks.

